Claim 13 has been amended as follows:

13. (Amended) A method for self-centering a wafer on a wafer pedestal according to claim 10 further comprising the step of self-centering the wafer on said wafer lifter during said positioning when said wafer is guided into a center position by said slanted surface on said tip portion of the at least four support fingers.

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REMARKS

Thorough examination and careful review of the application by the Examiner is noted and appreciated.

Claims 1-16 are pending in the application. Claims 1-16 stand rejected.

Objection To The Drawings

The drawings are objected to by the Examiner for numerous informalities.

Figure 1 has been amended to alleviate the Examiner's objections. A redlined copy is hereby submitted for the Examiner's approval.

Objection To The Claims

Claims 2 and 13 are objected to by the Examiner for containing informalities.

Claim 2 has been cancelled and withdrawn from further consideration by the Examiner.

Claim 13 has been amended to alleviate the Examiner's objections.

Claim Rejections Under 35 USC §112

Claims 10-16 are rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 10 has been amended to alleviate the Examiner's rejections.

Claim Rejections Under 35 USC §102

Claims 1-5, 7-11 and 13-14 are rejected under 35 USC §102(b) as being anticipated by Banholzer et al '198.

The rejection of claims 1-5, 7-11 and 13-14 under 35 USC §102(b) based on Banholzer et al is respectfully traversed.

Claim 1 has been amended to further recite the limitation originally contained in claim 6.

Claim 10 has been amended to further recite the limitation originally contained in claim 16.

The Applicants respectfully submit that independent claims 1 and 10, in their newly amended form, and their dependent claims 3-5, 7-9, 11, 13 and 14 are not anticipated by Banholzer et al. A reconsideration for allowance of these claims is respectfully requested of the Examiner.

Claim Rejections Under 35 USC §103

Claims 6, 12, 15 and 16 are rejected under 35 USC §103(a) as being unpatentable over Banholzer et al in view of Lamont, Jr. '556. It is contended that while Banholzer et al does not disclose the material of the lift member or the material sputter deposited, Lamont, Jr. discloses that to prevent contamination of a wafer during sputtering, all components within the sputter chamber should be coated with the material to be deposited. The Examiner therefore concluded that "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Banholzer to use aluminum as the material for the lift body because of the desire to prevent contamination when sputtering aluminum".

The rejection of claims 12 and 15 under 35 USC §103(a) based on Banholzer et al and Lamont, Jr. is respectfully traversed.

Claims 6 and 16 have been cancelled and withdrawn from further consideration by the Examiner.

Independent claim 1 has been amended to recite the additional limitation contained in dependent claim 6, while independent claim 10 now recites the additional limitation contained in dependent claim 16.

The Applicants respectfully submit that Banholzer et al and Lamont, Jr., either singularly or in combination thereof, does not teach a lift body that is fabricated of a material which has a rigidity of at least that of aluminum, or the step of fabricating a lift body for a wafer lifter with aluminum or stainless steel. Regarding the Examiner's contention that "Lamont, Jr. discloses ... all components within the sputter chamber should be coated with the material to be deposited" and further "to modify the invention of Banholzer to use aluminum as the material for the lift body because of the desire to prevent contamination when sputtering aluminum", the Applicants respectfully submit that such are not the present invention, i.e. the present invention does not aim at preventing contamination. Instead, the present invention teaches that the lift body must be fabricated of a material of sufficient rigidity, i.e. at least that of aluminum, or fabricated of aluminum or stainless steel, such that the lift body can sustain the high process temperature of the sputter chamber. Such criticality is

clearly presented in the specification on page 14, lines 7-11:

> "The design is such that when the wafer lifter is used in a fabrication process, the high temperature of the sputter chamber expands the wafer lifter and thus a small gap, such as 0.5 mm, between the wafer and the slanted shoulder portion is provided."

The rejection of claims 12 and 15 under 35 USC §103(a) based on Banholzer et al and Lamont, Jr. is respectfully traversed. The Applicants further submit that independent claims 1 and 10, which now contain the limitations contained in dependent claims 6 and 16, and the dependent claims of claims 1 and 10 are similarly patentable under Banholzer et al and Lamont, Jr.

Based on the foregoing, the Applicants respectfully submit that all of the pending claims, i.e. claims 1, 3-5 and 7-15, are now in condition for allowance. Such favorable action by the Examiner at an early date is respectfully solicited.

Attached hereto is a marked-up version of the changes made to the specification, claims and abstract by the current amendment. The attached page is captioned "Version With Markings To Show Changes Made".

In the event that the present invention is not in a condition for allowance for any other reasons, the Examiner is respectfully invited to call the Applicants' representative at his Bloomfield Hills, Michigan office at (248) 540-4040 such that necessary action may be taken to place the application in a condition for allowance.

Respectfully submitted,

Tung & Associates

Randy W. Tung
Reg. No. 31,311
Telephone: (248) 540-4040

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Specification

Paragraph 005 has been amended as follows:

005 One of the more important [component] components in the sputter chamber is the clamp ring which serves two purposes during a sputter process. The first purpose is to clamp the wafer to the pedestal heater. The clamp ring holds the wafer in place on the pedestal when a positive gas pressure is applied between the heater and the pedestal such that heat can be efficiently conducted from the heater to the wafer. The second purpose served by the clamp ring is to allow a predetermined flow of argon to leak from under the wafer into the sputter chamber. The clamp ring is generally constructed in a circular shape with an oriented cut-out to match a wafer's flat contour. A hood is built into the clamp ring and is used for shadowing purpose to protect the lip of the clamp ring from being coated by the sputtered

metal particles. The lip portion also allows the force of the clamp ring to be evenly distributed around the wafer.

Paragraph 006 has been amended as follows:

006 A cross-sectional view of a typical sputter chamber 10 is shown in Figure 1. Sputter chamber 10 is constructed by a stainless steel chamber body 12 that is vacuum-tight, a sputter target 16 of W, TiW or Sn, a wafer holder 20 equipped with a heater 22, a wafer lift mechanism 24, a wafer port 28, a pumping port 32, a clamp ring 30 and a chamber shield 34. A DC power supply 25 is connected to a target [21] 16 and a conductive part of the chamber, such as the chamber wall 18 or chamber shield 34, thereby establishing a voltage potential between the grounded chamber wall 18 and the target [21] 16. A DC bias circuit 23 is connected to the clamping ring and thus applies a DC bias to the wafer (not shown). The hood 36 of the clamp ring 30 protects the tip 38 from being coated by the sputtered particles. A perspective view of the same sputter chamber 10 is shown in Figure 2.

Paragraph 007 has been amended as follows:

007 As shown in Figure 1, the chamber shield 34 is another important component in the sputter chamber 10. It forms a seal between the clamp ring 30 and the chamber body 12 such that sputtered particles from the sputter target 16 do not contaminate the chamber wall 18 during a sputtering process. It should be noted that, during the sputtering process, the wafer pedestal 20 is in a raised position with the tip portion 38 of the clamp ring 30 touching the heater 22 on the pedestal 20. In order to achieve a tight seal from the chamber wall 18, a small gap [40] is normally maintained between the clamp ring 30 and the chamber shield 34. In a typical metal sputtering process where a W, TiW, Sn or other metal is used in the sputter chamber, the emission of sputtered particles of the metals is shaped with a forward cosine distribution such that a more desirable deposition process in which metal particles are deposited uniformly at the center and the edge of the wafer can be achieved.

In The Abstract

Paragraph 041 has been amended as follows:

041 [An] A wafer lifter for self-centering a wafer onto a wafer pedestal situated in a physical vapor deposition chamber and a method for self-centering a wafer onto the wafer pedestal are described. The wafer lifter is constructed by a lifter body of annular shape, at least four support fingers emanating upwardly from the wafer lifter body and are spaced-apart from each other, and a platform on a tip portion of each of the at least four support fingers defined by a slanted surface from a vertical plane of an outside surface of the support finger. The platform, when supporting a wafer thereon, leaves substantially no gap between the slanted surface and an outer periphery of the wafer.

In the Claims

Claims 2, 6 and 16 have been cancelled without prejudice.

Claim 1 has been amended as follows:

1. (Amended) A wafer lifter for self-centering a wafer on a pedestal comprising:

a lifter body of annular shape having a center cavity with a diameter that is larger than a diameter of the wafer pedestal, said lifter body is fabricated of a material that has a rigidity of at least that of aluminum;

at least four support fingers emanating upwardly from said lifter body and are spaced-apart from each other; and

a platform on a tip portion of each of said at least four support fingers defined by a slanted surface from a vertical plane of an outside surface of said support finger, said platform when supporting a wafer thereon leaves substantially no gap between said slanted surface and an outer periphery of the wafer.

Claim 10 has been amended as follows:

10. (Amended) A method for self-centering a wafer on a wafer pedestal comprising the steps of:

fabricating a lifter body for a wafer lifter with aluminum or stainless steel, said [providing a wafer lifter comprising a] lifter body [of] having an annular shape [having] and a center cavity with a diameter that is larger than a diameter of said wafer pedestal, said wafer lifter further having at least four support fingers emanating upwardly from said lifter body and are spaced-apart from each other, and a platform on a tip portion of each of said at least four support fingers defined by a slanted surface from a vertical plane of an outside surface of said support finger, said platform when supporting a wafer thereon leaves substantially no gap between said slanted surface and an outer periphery of the wafer;

positioning a wafer on said wafer lifter supported by said platform on said [top] tip portion of the at least four support fingers; and

lifting said wafer lifter to a position over said wafer pedestal and depositing said wafer onto said pedestal.

Claim 13 has been amended as follows:

13. (Amended) A method for self-centering a wafer on a wafer pedestal according to claim 10 further comprising the step of self-centering the wafer on said wafer lifter during said positioning [step] when said wafer is guided into a center position by said slanted surface on said tip portion of the at least four support fingers.